Management of Small Docks and Piers

Environmental Impacts

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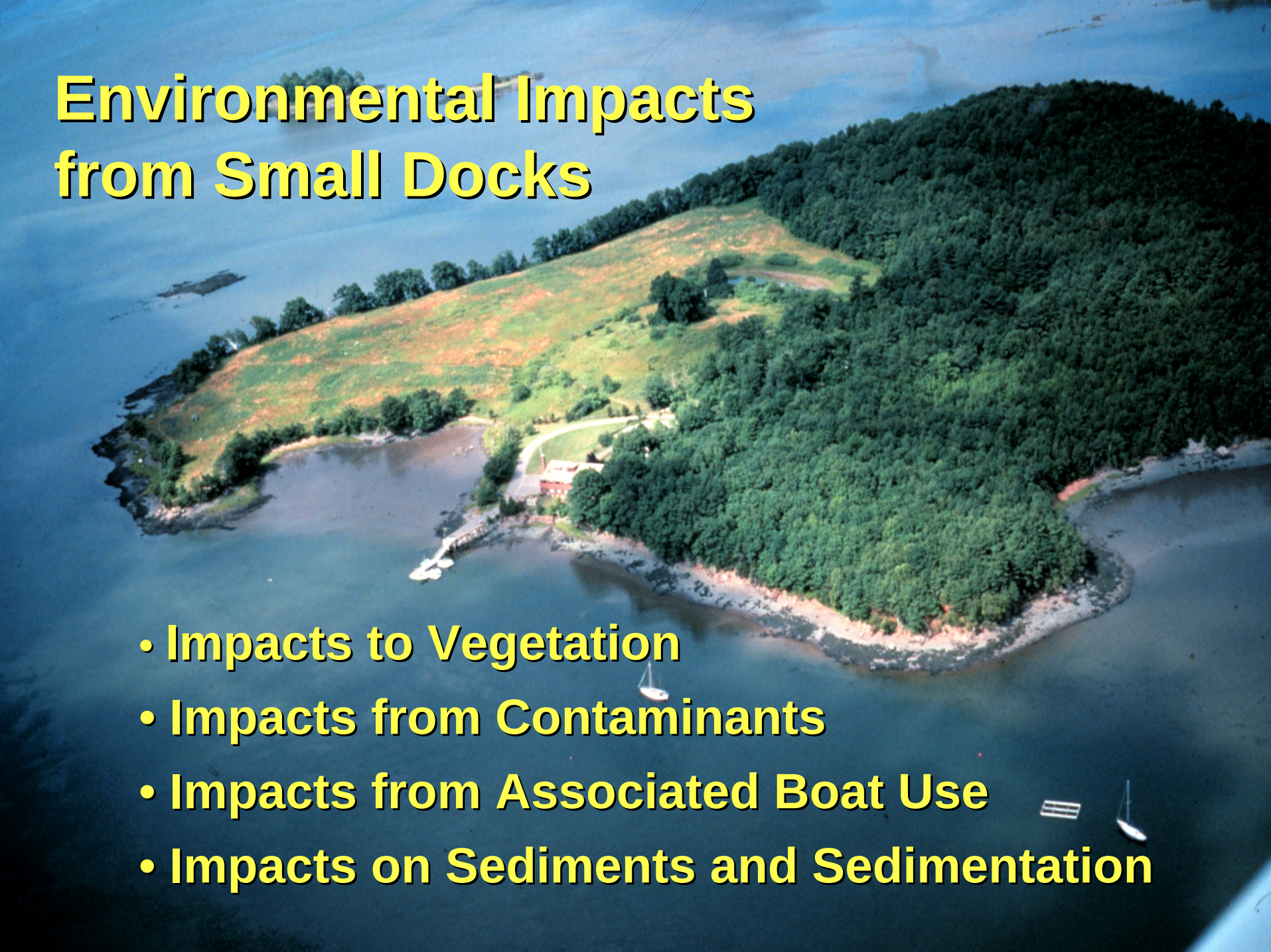
Environmental Impacts from Small Docks



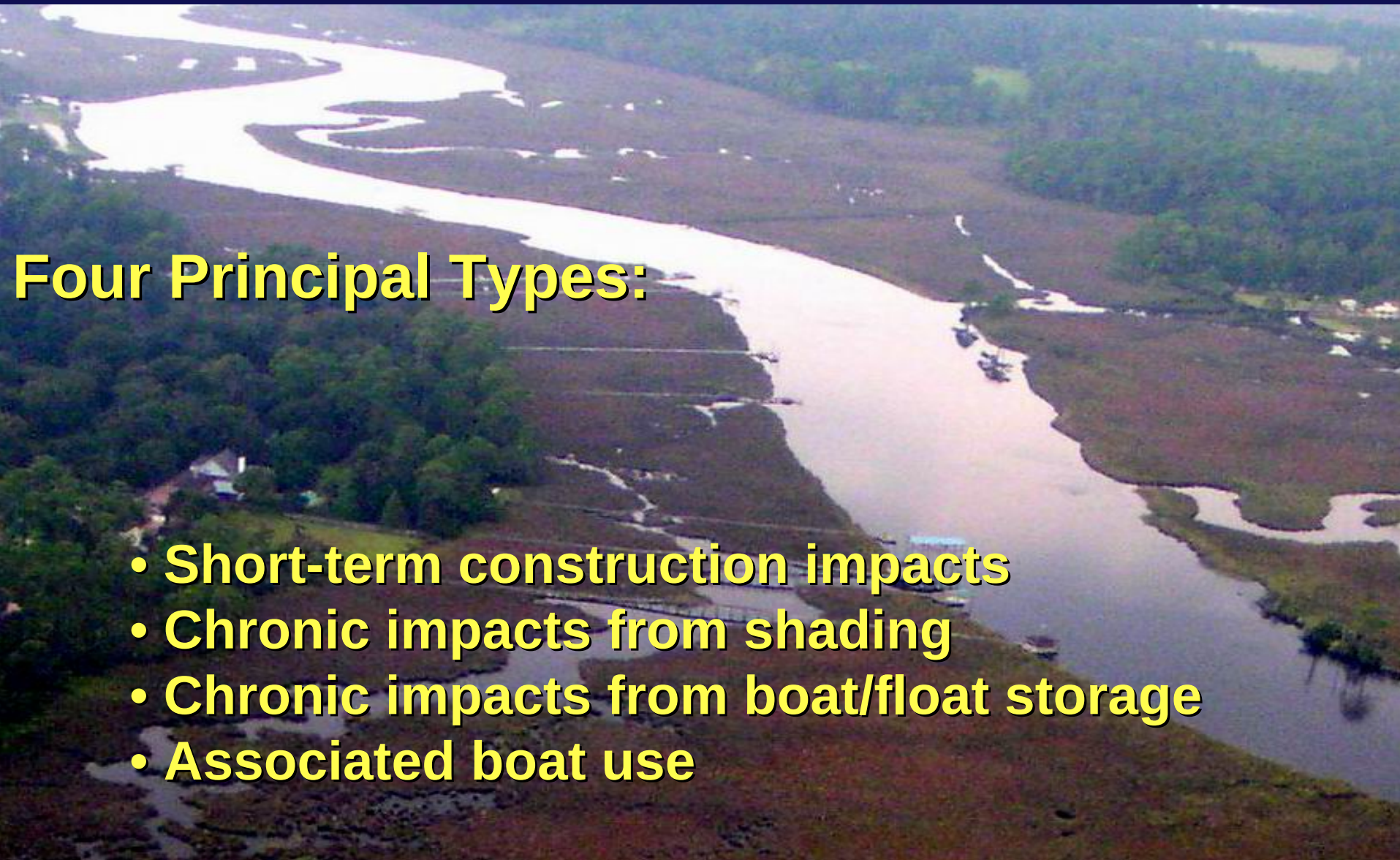
- Impacts to Vegetation
- Impacts from Contaminants
- Impacts from Associated Boat Use
- Impacts on Sediments and Sedimentation

Impacts On Vegetation

Submerged Aquatic Vegetation and Marsh Grasses

- Form basis of marine food web
- Provide critical habitat
- Filter nutrients and contaminants
- Stabilize sediments

Impacts On Vegetation



Four Principal Types:

- Short-term construction impacts
- Chronic impacts from shading
- Chronic impacts from boat/float storage
- Associated boat use

Impacts On Vegetation

Short-term Construction Impacts

- Destruction of vegetation
- Changes in elevations
- Opportunities for regrowth

Impacts On Vegetation

Shading is the obvious impact of docks …

Impacts On Vegetation

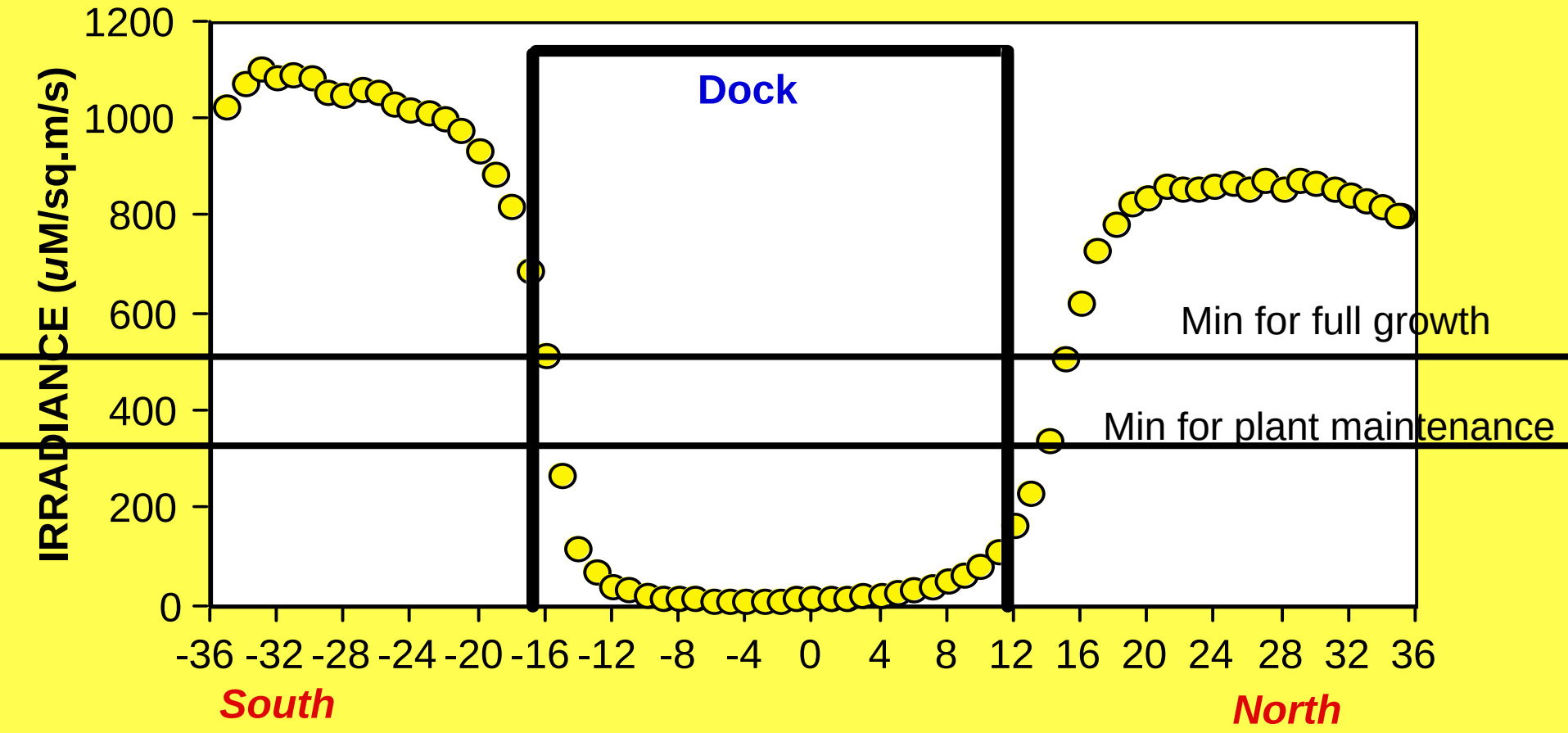
- Impacts include
  - Reduced shoot density
  - Reduced biomass
  - Reduced growth
  - Increased height (due to etiolation)
  - Increased erosion, undercutting of vegetation

- Susceptibility varies by species:

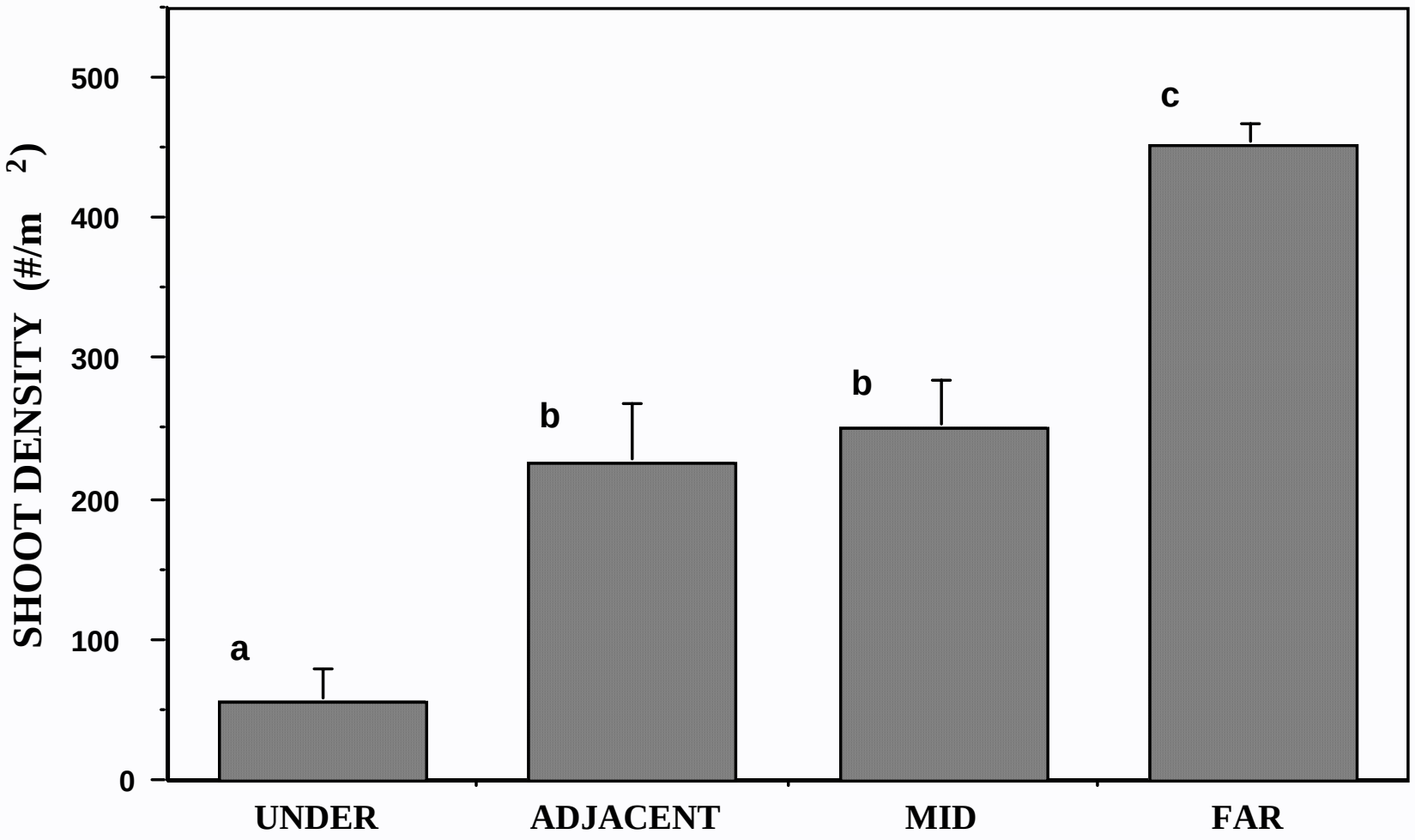
Spartina patens	Distichlis spicata	S. alterniflora
Min		Max

Impacts On Vegetation

Light Profile Under a Dock

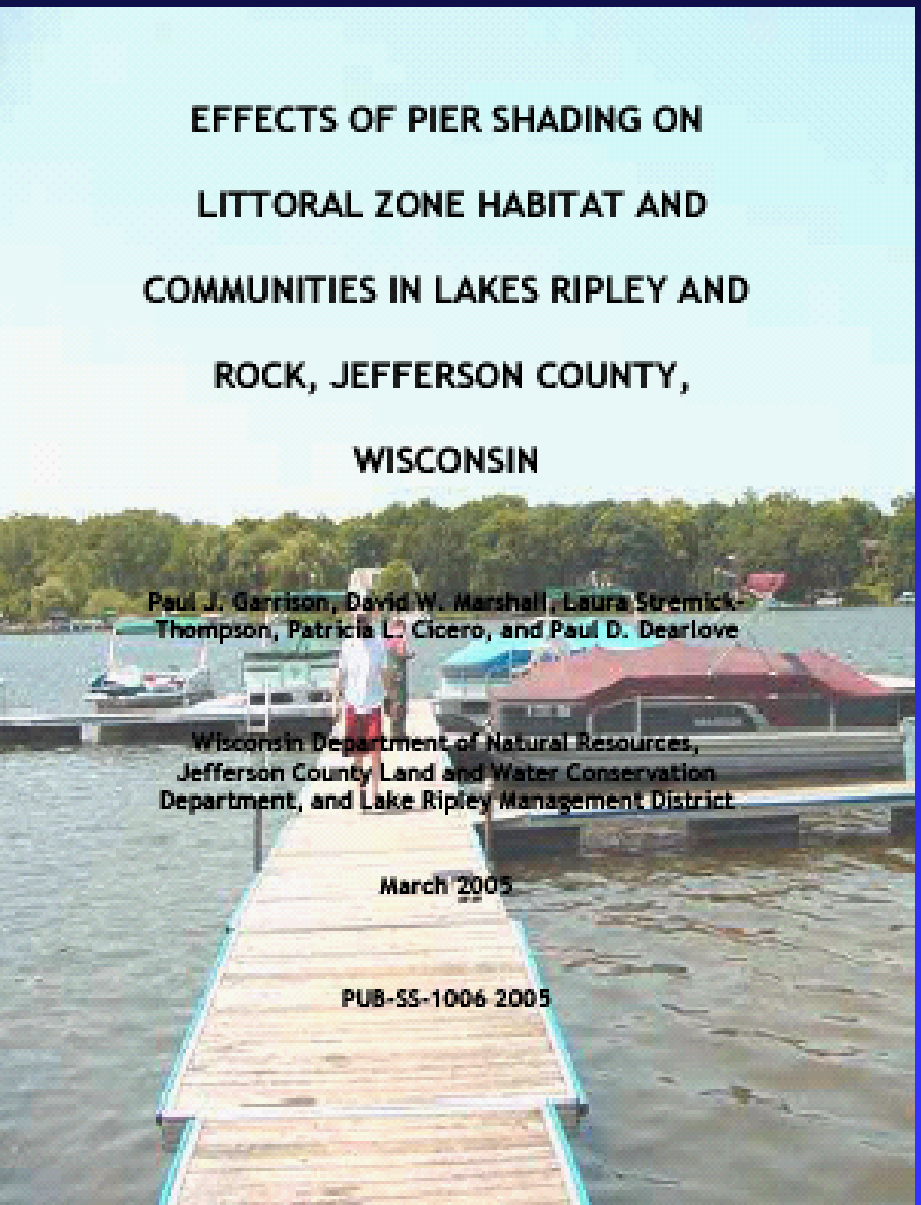


Impacts On Vegetation



Eelgrass Density Under and Adjacent to Docks

Impacts On Vegetation



Similar Impacts in Fresh water

- Significant shading
- Reduced plant abundance
- Fewer fish and invertebrates
- Reduced species diversity

Impacts From Contaminants

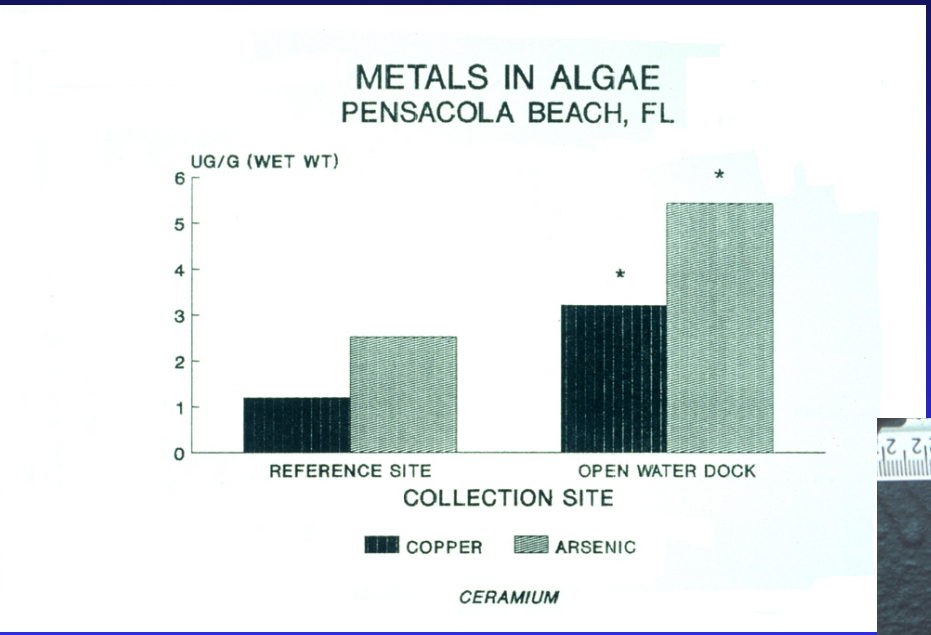
Wood preservatives include:

- Creosote
- Pentachlorophenols
- Chromated Copper Arsenate

Impacts From Contaminants

Retentions *(lbs./cu.ft.)*	Uses/Exposures
0.10 – 0.25	Above ground
0.21 – 0.41	Soil & Freshwater use
0.31– 0.61	Permanent Wood Foundation
2.50	Salt water use

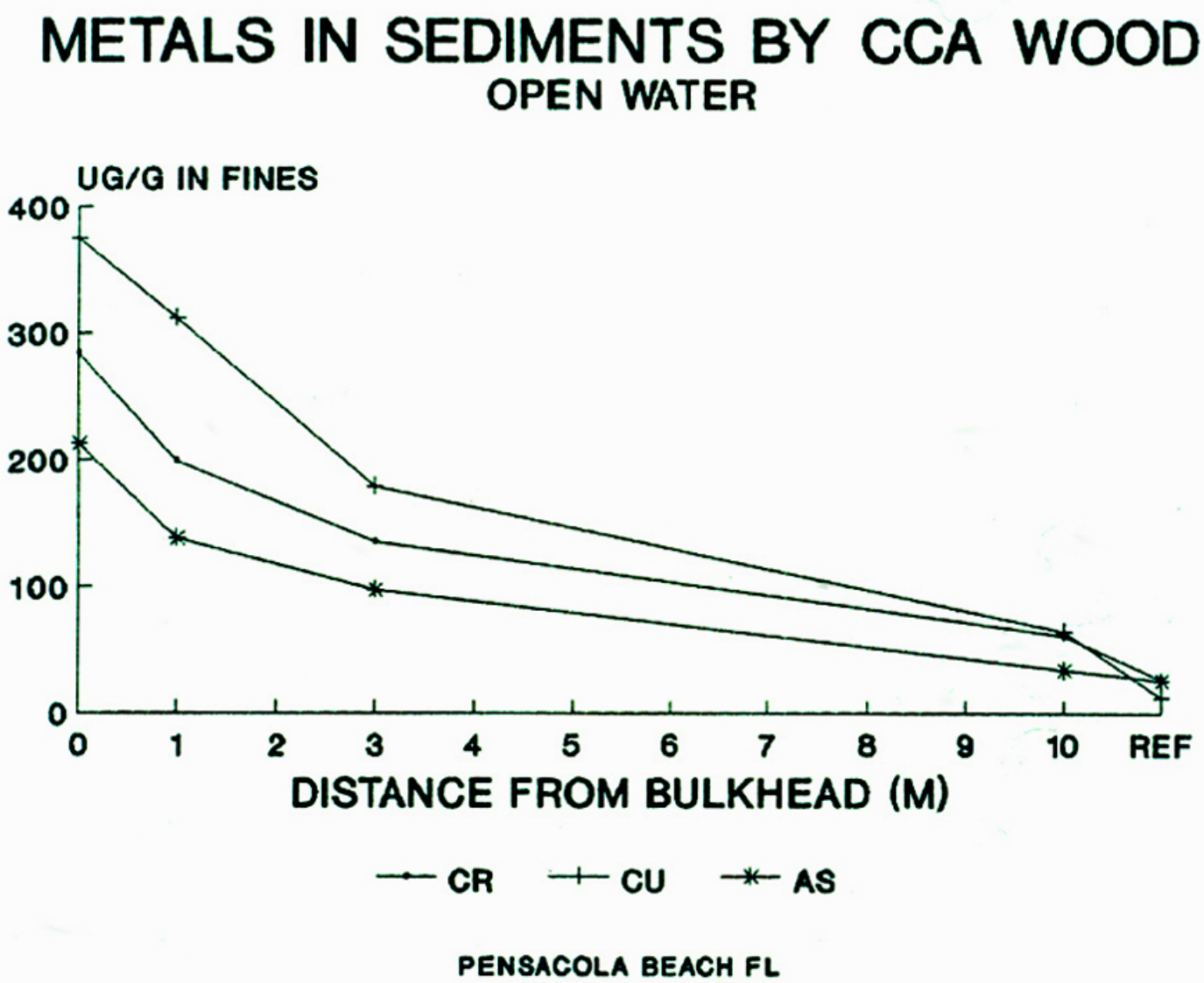
Impacts From Contaminants



Metal Uptake in Algae

Digestive Gland Metaplasia in Oysters

Impacts From Contaminants



- **Creeks with vs. without docks:**
  - **Same sediment Cu, Cr and As concentrations.**
  - **Oysters attached to pilings had > [Cu], but no physiological effects or acute toxicity.**
- **Creeks with new docks (4-12 mo.) vs. creeks without docks:**
  - **Same percent survival of mummichogs, juvenile red drum, white shrimp, mud snails, and oysters.**

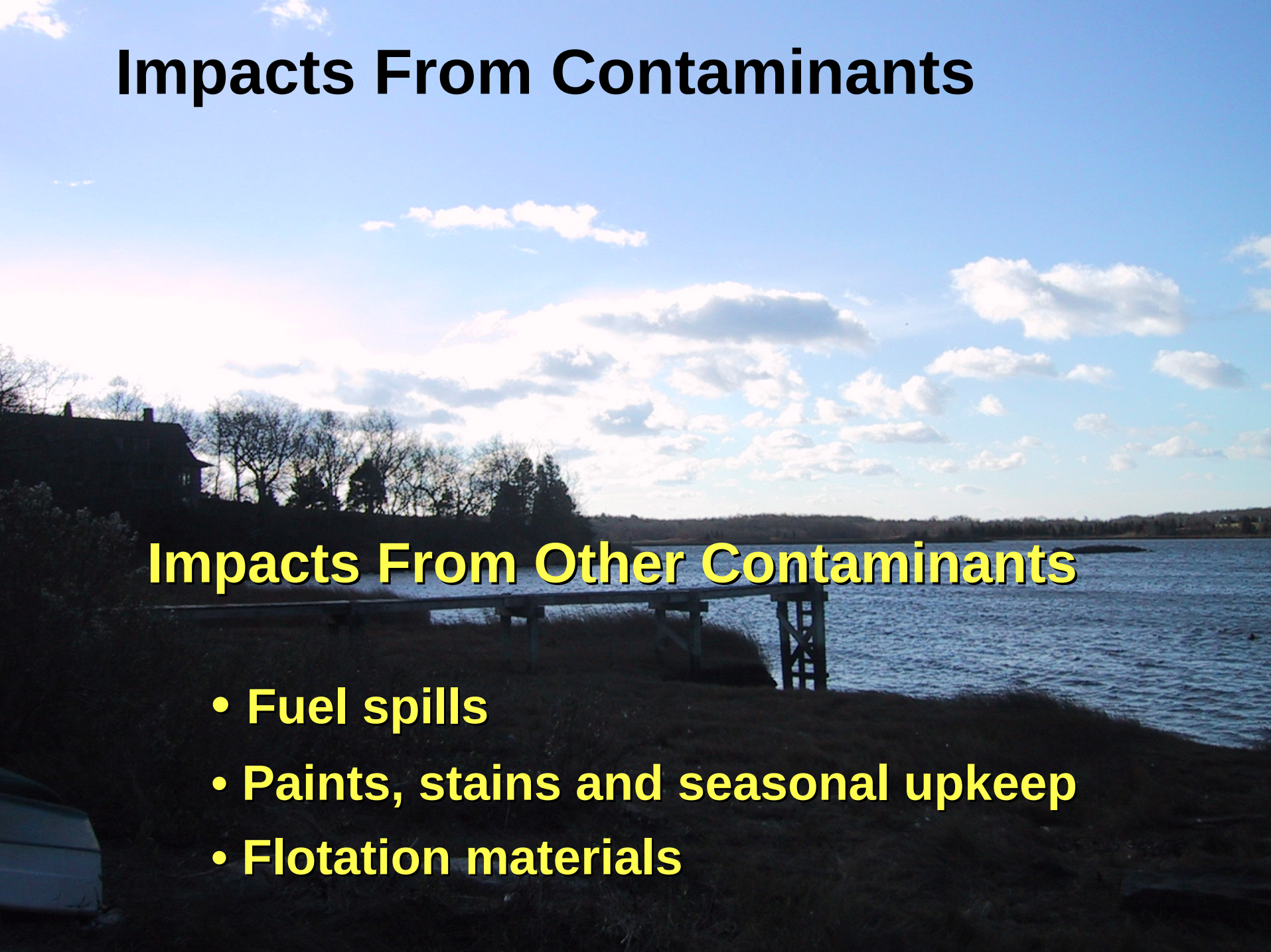
Priscilla Wendt, Robert Van Dolah, South Carolina Dep't Natural Resources, 2001 l

Impacts From Contaminants

- CCA Leaching Decreases with Age
  - 99% leaching completed within 90 days

- CCA Impacts Depend on Flow and Flushing
  - Measurable impacts in low flushing areas
  - No impact observed in high flushing areas

Impacts From Contaminants



Impacts From Other Contaminants

- Fuel spills
- Paints, stains and seasonal upkeep
- Flotation materials

Impacts to Sediments and Bottom Topography

Alteration of Flows and Deposition

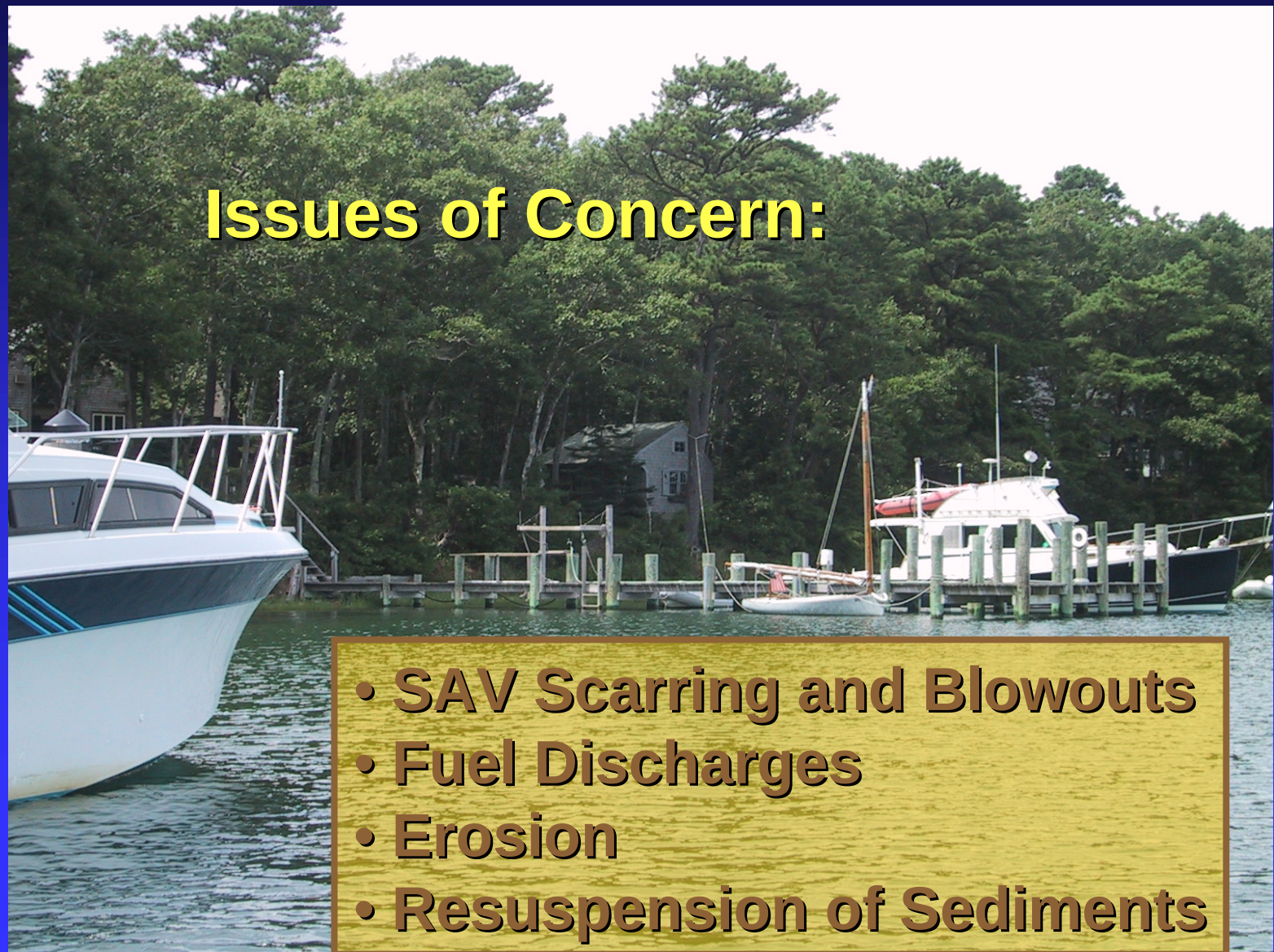
Impacts to Sediments and Bottom Topography

Disruption During Pile Installation

Impacts to Sediments and Bottom Topography

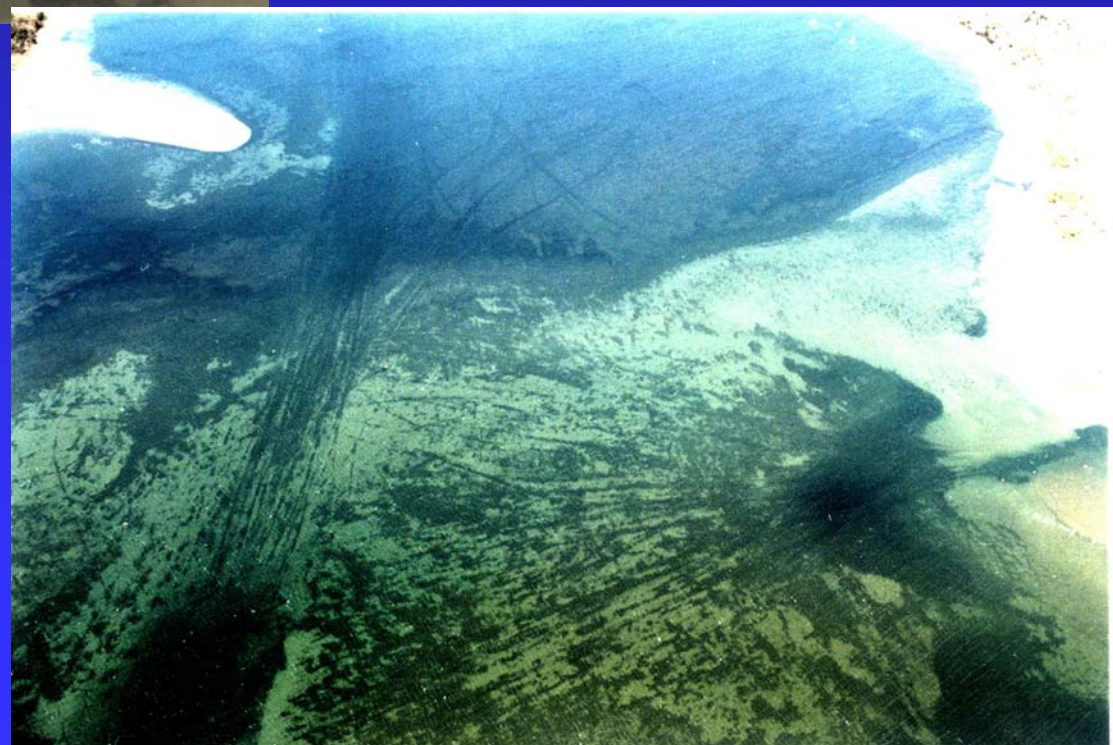
"Pumping" by boats and floats

Impacts From Boating Use



Impacts From Boating Use

Prop Scarring



Waquoit Bay, MA

Impacts From Boating Use

Fuel Spills

Impacts From Boating Use

Erosion and Slumping

Impacts From Boating Use